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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,329	12/18/2006	Liming Lou	290609US3PCT	8034
22850	7590	02/05/2009	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ALTUN, NURI B	
			ART UNIT	PAPER NUMBER
			3657	
			NOTIFICATION DATE	DELIVERY MODE
			02/05/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/577,329	<b>Applicant(s)</b> LOU ET AL.	
	<b>Examiner</b> NURI ALTUN	<b>Art Unit</b> 3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/21/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

This communication is a first Office Action Non-Final rejection on the merits.

Claims 1-9 are currently pending and have been considered below.

#### ***Claim Objections***

Claims **8 and 9** are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim (Claims 3 and 5). See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1, 2 and 6** are rejected under 35 U.S.C. 102(b) as being anticipated by **Van Rooij et al. (5,728,021)**.

**As per claim 1**, Van Rooij et al. teach a power transmission chain including: a plurality of links (33) having front and back insertion parts (35, 37, 41) through which pins (45) are inserted; and a plurality of first pins (45) and a plurality of second pins (47) for connecting the links aligned in a chain width direction so as to be bendable in a longitudinal direction such that a front insertion part of one link and a back insertion part of another link correspond to each other, in which a first pin fixed to a front insertion part of one link and movably fitted in a back insertion part of another link and a second pin

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movably fitted in the front insertion part of the one link and fixed to the back insertion part of the other link move relatively in a rolling and contacting manner so as to enable bending in a longitudinal direction between the links (col.4, lines 4-21),

wherein at least two kinds of sets of pins (45 and 79; 47 and 75) are provided in which loci of rolling contact movement of the first pin and the second pin are different (see Rb and Rw in Fig. 9), and the sets of pins are aligned randomly (col.6, lines 5-6 and see Figs. 4 and 6; upon viewing the Figures, it is clearly seen that pins (45 and 47) are aligned not on a specific axis due to rolling and contacting manner, but aligned randomly).

**As per claim 2**, Van Rooij et al. teach two or more kinds of links (33) having different pitches are formed, and the links are aligned randomly (col.3, lines 60-62).

**As per claim 6**, Van Rooij et al. teach a locus of a contact position of the first pin and the second pin is an involute of a circle (see Fig. 9), and a basic circle radius of an involute of a link having a large pitch is larger than a basic circle radius of an involute of a link having a small pitch (col.3, lines 60-62' it is inherent that an involute of a link with a larger pitch will have a larger circle radius than that of a link with a smaller pitch.)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **3-5 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**.

**As per claim 3**, Van Rooij et al. teach all the structural limitations of the claimed invention, but do not explicitly disclose a locus of the rolling contact movement is an involute curve of a circle whose basic circle radius is  $R_b$  obtained by  $x = R_b(\sin \gamma - \gamma \cos \gamma)$ , and  $y = R_b(\cos \gamma + \gamma \sin \gamma) - R_b$ , where a contact position of the first pin and the second pin in a chain linear part is an origin, a chain linear direction is an x axis, a direction orthogonal thereto is a y axis, and an angle defined by a pin tangential direction with respect to the y axis at a contact position of the first pin and the second pin in a chain curved part is  $\gamma$ .

However, the reference teaches two different radii of two different pins' loci of rolling contact movement. Based on this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the circle radius of the locus of rolling contact movement to be  $x = R_b(\sin \gamma - \gamma \cos \gamma)$ , and  $y = R_b(\cos \gamma + \gamma \sin \gamma) - R_b$  in order to reduce level of noise generated during use.

Also, *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

**As per claim 4**, Van Rooij et al. teach all the structural limitations of the claimed invention, but do not explicitly disclose the following relationships are established:

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$R_b = kR$ , and  $0.25 < k < 2r$ , where, when used as a chain for a CVT, a minimum radius of the chain curved part is  $R$ , and a transmission ratio of the CVT is  $r$ .

However, the reference teaches the chain is a transmission chain (see abstract). Based on this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the basic circle radius to be  $R_b = kR$ , and  $0.25 < k < 2r$  in order to reduce level of noise generated during use.

Also, *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

**As per claim 5**, Van Rooij et al. further teach a locus of the rolling contact movement is a non-involute curve (col.5, lines 37-41; straight line is considered as a non-involute curve).

However, Van Rooij et al. do not explicitly disclose a locus of the rolling contact movement is a non-involute curve in a range between an involute curve of a circle of an allowable lower limit and an involute curve of a circle of an allowable upper limit, the allowable lower limit being obtained by  $x = 0.25R(\sin \gamma - \gamma \cos \gamma)$ , and  $y = 0.25R(\cos \gamma + \gamma \sin \gamma) - 0.25R$ , the allowable upper limit being obtained by  $x = 2rR(\sin \gamma - \gamma \cos \gamma)$  and  $y = 2rR(\cos \gamma + \gamma \sin \gamma) - 2rR$ , where a contact position of the first pin and the second pin in a chain linear part is an origin, a chain linear direction is an x axis, a direction orthogonal thereto is a y axis, an angle defined by a pin tangential direction with respect to the y axis at a contact position of the first pin and the second pin in a

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chain curved part is  $\gamma$ , a minimum radius of the chain curved part when used as a chain for a CVT is  $R$ , and a transmission ratio of the CVT is  $r$ .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the non-involute curve of the locus of the rolling contact movement range's upper and lower limit to be defined by the above equation in order to maintain the noise within desirable limits.

Also, *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

**As per claim 7**, Van Rooij et al. teach a power transmission chain including: a plurality of links (33) having front and back insertion parts (35, 37, 41) through which pins (45) are inserted; and a plurality of first pins (45) and a plurality of second pins (47) for connecting the links aligned in a chain width direction so as to be bendable in a longitudinal direction such that a front insertion part of one link and a back insertion part of another link correspond to each other, in which a first pin fixed to a front insertion part of one link and movably fitted in a back insertion part of another link and a second pin movably fitted in the front insertion part of the one link and fixed to the back insertion part of the other link move relatively in a rolling and contacting manner so as to enable bending in a longitudinal direction between the links (col.4, lines 4-21), wherein a locus of a contact position of the first pin and the second pin is an involute of a circle (col.5, lines 40-41).

However, Van Rooij et al. do not explicitly disclose [basic circle radius of involute]/[height of pin]=5 to 20.

Upon viewing Fig. 9, it is seen that height of pin (101) is greater than basic circle radius. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the ratio of [basic circle radius of involute]/[height of pin]=5 to 20. in order to reduce level of noise generated during use.

Also, *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference Takeda et al. (5,419,743) teaches a low noise chain drive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NURI ALTUN whose telephone number is (571)270-5807. The examiner can normally be reached on Mon-Fri 7:30 - 5:00 with first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272 7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/  
Primary Examiner, Art Unit 3657

NBA